

FORMATION OF COMPOUND SEMICONDUCTOR LAYER

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Patent Number: JP2014513
Publication date: 1990-01-18
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Requested Patent: ☐ JP2014513
Application Number: JP19890108376 19890426
Priority Number(s):
IPC Classification: H01L21/205
EC Classification:
EC Classification:
Equivalents: JP1989626C, JP7019756B

Abstract

PURPOSE: To enhance the flatness on the surface of a compound semiconductor layer by a method wherein, after a GaAs layer has been vapor-grown at a first prescribed temperature on an Al atomic layer vapor-grown on an Si single-crystal substrate, a GaAs epitaxial layer is vapor-grown on it at a second prescribed temperature.

CONSTITUTION: An Si substrate 1 is stabilized at a prescribed temperature in an atmosphere of hydrogen; after that, trimethylaluminum (TMA) is introduced; an Al atomic layer 2 is generated on the surface. Then, the residual TMA is discharged; after that, AsH₃-hydrogen-trimethylgallium (TMG)-hydrogen constituting one cycle are introduced repeatedly. Then, a GaAs molecular layer 5 is formed on the Al atomic layer 2; after that, the introduction of the raw-material gases is stopped. Then, after a temperature has been raised and a prescribed temperature has been stabilized, TMG and AsH₃ are introduced simultaneously in the same manner as in an ordinary metal organic chemical vapor growth method; a single-crystal GaAs layer 7 of excellent flatness is grown epitaxially on the GaAs molecular layer 5. After a prescribed thickness has been reached, the introduction of the raw material gases is stopped.